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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------------|------------------|
| 09/696,863 | 10/25/2000 | Shunpei Yamazaki | 07977/150003/US3336/3421D | 2608 |

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| EXAMINER |
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WELLS, NIKITA

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| ART UNIT | PAPER NUMBER |
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2881

DATE MAILED: 06/13/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | |
|------------------------------|------------------------|---------------------|
| Office Action Summary | Application No. | Applicant(s) |
| | 09/696,863 | YAMAZAKI ET AL. |
| | Examiner | Art Unit |
| | Nikita Wells | 2881 |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 28 April 2003.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 10,21,22,24-26,28 and 46-61 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) 10,21,22,24-26,28 and 46-53 is/are allowed.
- 6) Claim(s) 54-61 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 25 October 2000 is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) The proposed drawing correction filed on _____ is: a) approved b) disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. 08/855,818.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
 - a) The translation of the foreign language provisional application has been received.
- 15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

| | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>11&13</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. The Applicant filed a "Request for Continued Examination" and "Response" received April 28, 2003, where he amended claims 10, 21, 24, 25, and 28; canceled claims 1-9, 11-20, 23, 27, and 29-45; added new claims 46-61; and made an in-depth analysis of the existing claims.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 54, 57, 58, and 61, are rejected under 35 U.S.C. 102(b) as being anticipated by Yoshida et al. (4,859,908).

With respect to claims 54 and 58, Yoshida et al. disclose (Figs. 5 and 6; Col. 4, lines 11-18; Col. 9, lines 11-15 and 20-26) an ion doping apparatus comprising: a means for generating an ion beam having an elongated cross section; a means for applying a magnetic field and an electric field to said ion beam (Col. 4, lines 11-18) to separate said ion beam into at least two ion beams on a mass basis; and a stage which moves in a direction substantially perpendicular to the ion beam (Col. 9, lines 11-15).

With respect to claims 57 and 61, Yoshida et al. disclose (Col. 9, lines 1-6) an ion doping apparatus, further comprising an accelerating electrode (410a) to accelerate the ion beam.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 55, 56, 59, and 60, are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshida et al. (4,859,908) in view of Yamazaki et al. (6,165,876).

With respect to claims 55 and 59, although Yoshida et al. disclose an ion doping apparatus for generating an ion beam having an elongated cross section and a means for applying a magnetic field and an electric field to the ion beam, they fail to disclose a means for irradiating a laser beam having an elongated cross section. However, Yamazaki et al. disclose (Col. 8, lines 52-57) the doping of crystalline silicon film with a means for irradiating a laser beam having an elongated cross section.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to recognize and substitute the doping of crystalline silicon film of Yamazaki et al. into the ion doping apparatus of Yoshida et al., in order to obtain the dependable and reproducible processing of a substrate having a large area.

With respect to claims 56 and 60, although Yoshida et al. disclose an ion doping apparatus for generating an ion beam, they fail to disclose that the magnetic field has a strength between 0.1 and 10 tesla, which is considerably higher than the 0.05 tesla of Yoshida et al. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to increase the value of the magnetic field strength to between 0.1 and 10 tesla, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art (in re Aller, 105 USPQ 233).

Allowable Subject Matter

6. Claims 10, 21, 22, 24-26, 28, and 46-53 are allowed.

7. The following is an examiner's statement of reasons for allowance:

The Applicant demonstrated to the Examiner's satisfaction that, with respect to the 35 U.S.C. 103(a) rejection of the independent claims, the references of Yamazaki et al. (6,165,876) and King et al. (5,760,405) are not applicable to the Applicant's invention. With respect to the independent claims 10, 21, 25, neither Yamazaki et al., nor King et al., nor any other prior art, disclose an ion doping apparatus which utilizes coils whose diameter are monotonically increased as the flow of ions extends down stream along the beam axis towards the substrate. With respect to the independent claims 46 and 50, neither Yamazaki et al., nor King et al., nor any other prior art, disclose or make obvious that in an ion doping apparatus generating an ion beam having an elongated beam cross section, the first magnetic field has the same magnitude as the second magnetic field and an opposite direction to the second magnetic field.

The dependent claims 22 and 24, 26 and 28, 47-49, and 51-53, are allowed by virtue of their dependence upon claims 21, 25, 46, and 50, respectively.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nikita Wells whose telephone number is (703) 305-0416. The examiner can normally be reached on 8:30 AM - 5:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R Lee can be reached on (703) 308-4116. The fax phone numbers for the organization where this application or proceeding is

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assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.



Nikita Wells
Examiner
Art Unit 2881

Nikita Wells
May 29, 2003